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High-Impact Educational Practices: An Exploration of the Role of Information Literacy

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Abstract

There is an expectation that college students graduate with competency in information literacy. Ideally, institutions of higher education integrate these competencies throughout their curricula in a progressive manner. High-impact educational practices contribute to student success. The purpose of this article is to examine recent literature about five of the high-impact educational practices (capstone experiences, learning communities, service learning and community-based learning, undergraduate research, and writing-intensive courses) to understand the extent to which they include the integration of information literacy competencies. The article includes recommendations for practice and research in the areas of assessment, pedagogy, and program planning.

Keywords: information literacy, high-impact practices, higher education, academic libraries, collaboration

Introduction

The Association of American Colleges and Universities (AAC&U), through its Liberal Education and America's Promise (LEAP) initiative, identified essential learning outcomes

for the twenty-first century. Among those is “intellectual and practical skills,” which includes information literacy (IL) and related competencies such as inquiry and analysis, critical thinking, written and oral communication, and quantitative literacy (Kuh 2008).

There is an association between some postsecondary educational practices and increased student learning, engagement, and retention. Research on college student learning indicates that it occurs in a holistic way both in and outside the classroom. It is most effective when it includes active student participation, with meaning associated with the activities (Pascarella and Terenzini 2005). High-impact educational practices are:

- Capstone courses and projects
- Collaborative assignments and projects
- Common intellectual experiences
- Diversity/global learning
- First-year seminars and experiences
- Internships
- Learning communities
- Service learning and community-based learning
- Undergraduate research
- Writing intensive courses (Kuh 2008)

AAC&U mapped these practices and skill-intensive courses (quantitative reasoning, oral communication, and information literacy across the curriculum) to each of the essential learning outcomes for the twenty-first century. There are links between six of the eleven high-impact practices (collaborative assignments and projects, first-year seminars and experiences, internships, skill-intensive courses, undergraduate research, and writing-intensive courses) and the information literacy outcome (Kuh 2008). A review of the literature on first-year seminars, learning communities, service learning, undergraduate research, and capstone projects also indicated relationships to information literacy-related outcomes (Brownell and Swaner 2010). Snively (2008) observed that information literacy was integrated with first-year seminars and experiences, common intellectual experiences, learning communities, and writing-intensive courses in many colleges and universities. This article contributes to these studies by examining literature in a variety of disciplines to glean elements of information literacy in articles, even if these elements were not explicitly stated or studied. It includes recommendations based on the literature.

The purpose of this article is to examine the literature about five selected high-impact educational practices to understand the extent to which they integrate information literacy competencies. Do reports about capstone experiences, learning communities, service learning and community-based learning, undergraduate research, and writing-intensive courses include the expectation that students either have as a prerequisite or should acquire competency in information literacy during the experience? The answer to this question will provide a deeper understanding of the extent to which information literacy is integrated into current high-impact practices. This exploration may provide indications of whether

academic librarians should develop specific strategies to work with students who engage in these practices. It may raise questions for future research.

To explore the question, the authors examined journal articles and books published from 1999 to 2010 about five of the high-impact educational practices: service learning and community-based learning, undergraduate research, writing-intensive courses, learning communities, and capstone experiences. The sources searched included the ERIC; Education FullText; Library Literature and Information Science Full Text; Library, Information Science and Technology Abstracts; WorldCat; and ProQuest Digital Dissertations and Theses databases. The authors examined articles for indications of information literacy competencies (ACRL 2000) in prerequisites, outcomes, or learning activities associated with the practice. The recommendations for practice and research developed from that examination.

Capstone Experiences

Capstone courses or projects, senior seminars, or preceptorships are culminating experiences offered in the senior year of undergraduate studies. The influential 1998 Boyer Commission Report on improving undergraduate education emphasized the importance of capstone courses. In a student's final semester of college, "all the skills of research developed in earlier work should be marshaled in a project that demands the framing of a significant question or set of questions, the research or creative exploration to find answers, and the communication skills to convey the results to audiences both expert and uninitiated in the subject matter" (The Boyer Commission 1998, 27). Capstone experiences had an impact on students who participate in them, contributing "substantially to developing intellectual curiosity, learning independently, thinking critically, and making decisions based on evidence and reasoning" (National Survey of Student Engagement [NSSE] 2009, 11).

Information Literacy and Capstone Experiences

The goals of many capstone experiences included aspects of information literacy. Disciplines that indicated information literacy expectations included:

- Economics: Define research questions, conduct literature searches, locate and analyze data, summarize literature, draw conclusions, write reports, and present findings (Brooks, Benton-Kupper, and Slayton 2004; McGoldrick 2008).
- Engineering: Define problem statement; write design proposal, status memorandum, notebook documenting the design process, and report (Ostheimer and White 2005).
- Gerontology: Create an annotated bibliography (Sasser 2005); plan a research study in teams, think critically, write research papers, prepare posters and presentations (Robbins, Kinney, and Kart 2008).
- Math: Synthesize research (Narasimhan 2009), find books, find additional references at the end of chapters, and evaluate websites (Mayfield 2001); write papers, give presentations (Bolinger, Engle, and McConnell 2001).

- Technical communications: Identify research questions, gather primary source materials, write about a study, find articles through library databases, develop annotated bibliographies and literature reviews, and synthesize and organize information (Ford, Bracken, and Wilson 2009).
- Nursing: Use literature to identify a need for a teaching tool (Epstein 2007).
- Information technology: Find references; write an executive summary report (Matos and Grasser 2007).
- Psychology: Research graduate schools and give presentations (Roscoe and Strapp 2009).
- Biological sciences, chemistry, and biochemistry: Prepare an annotated bibliography, write a grant proposal, and give an oral presentation (Oh et al. 2005).

Learning Communities

Learning communities exist in different formats, including linked courses, learning clusters, interest groups for first-year students, and coordinated studies (Frank, Beasley, and Kroll 2001). They promote shared knowledge (a coherent, connected curricular experience), shared knowing (students connect socially and intellectually), and shared responsibility (mutually dependent collaborative learning) (Tinto and Engstrom 2003). Learning communities may incorporate other high-impact practices and often include undergraduate research or service learning. Literature citing the impact of learning communities reported positive correlations between student participation and personal and social development, educational involvement and satisfaction (Zhao and Kuh 2004). Learning community participation has been linked to intellectual and cognitive development (Shapiro and Levine 1999). Walker's (2003) study determined that participation was significantly and positively associated with four cognitive outcomes, including critical thinking, analytical thinking/problem-solving, reading skills, and writing skills. Stefanou and Salisbury-Glennon (2002) reported correlations between learning communities and cognitive learning strategies, including rehearsal strategies, organization strategies, time management, peer learning, and critical thinking.

Information Literacy and Learning Communities

Information seeking and use are social and collaborative processes in today's networked age. Recent findings from Project Information Literacy revealed that students most frequently asked their peers and professors for guidance when they had an information need; 61 percent turned to friends and family for help with information for personal use; and 49 percent asked instructors for assistance with evaluating sources for course work (Head and Eisenberg 2010). Harris (2008, 250) argued that the development of information literacy skills requires interaction between people and does not occur "in a vacuum, away from community contexts where meanings and values are in play." The integral social components of information literacy could create opportunity for practice and reinforcement of information literacy within learning communities, which are based on shared learning.

The literature documents librarians engaging with first-year learning communities to teach introductory library research or information literacy skills:

- Thematic courses that link information literacy and technology skills (Frank, Beasley, and Kroll 2001; Hensley and Lebbin 2002; Lebbin 2006; Frazier 2006)
- Librarians serving as information literacy liaisons for learning communities (Young and Duvernay 2006)
- Supporting learning communities with instructional teams consisting of librarians, instructors, and program coordinators (Laufgraben and Shapiro 2004)

Service Learning and Community-Based Learning

Most definitions of service learning include experiential learning as part of organized experiences that meet community needs. Reflection and the opportunity to apply knowledge in the discipline are key components. Students are confronted with “real-world” problems and are asked to develop solutions in the context of the course subject matter. Studies report student gains in community awareness, interest and success in graduate school, overall student development and satisfaction, and critical thinking (Eyler 2003; Eyler and Giles 1999; Spiezio, Baker, and Boland 2005; Sedlak et al. 2003). Researchers reported positive effects in the following areas: academic performance (including GPA, writing skills, and critical thinking), values (including commitment to activism and diversity), self-efficacy, leadership, choice of a service career, and plans to participate in service after college (Astin et al. 2000).

Information Literacy and Service Learning

Several authors documented a relationship between service learning and the development of information literacy skills. Spiezio, Baker, and Boland (2005) reported marked gains in problem-solving, planning and completing a project, knowing where to find information, analyzing and synthesizing it, and having the ability to make sound ethical decisions. Others described the transformative learning that occurred while attempting to solve complex problems. “People develop more complex structures for dealing with information when the approaches they commonly use are challenged and prove inadequate” (Eyler and Giles 1999, 117). Quitadamo and colleagues (2008) advocated for community-based inquiry (CBI) or undergraduate research experience paired with service learning. Students developed research questions related to community needs, articulated hypotheses, conducted experiments, and analyzed and presented data. The study revealed significant improvement in critical thinking skills, including inference and evaluation. Vogelsgang and O’Byrne (2003) reported on an eight-week experience that focused on the theme of immigration issues in Los Angeles, for which students conducted research with the community and presented findings to fellow students, faculty, and representatives from the community agencies. A program evaluation revealed that students believed that the experience improved their ability to design a study, create a survey instrument, collect data, and present research findings.

Undergraduate Research

Research experiences in undergraduate education have increased since the mid-1990s, partially due to support from the NSF and the Boyer Commission's 1998 report, which challenged research universities in the United States to make such experiences a standard part of science education (Kuh 2008; Hu, Kuh, and Gayles 2007). Interest in this high-impact practice continues to increase, as demonstrated by the publication of a special issue of *Peer Review* (Carey 2010). Studies reported academic and personal gains among students who participated in these experiences, including increased confidence in their research and science-related abilities, career and graduate school preparation and clarification, and skills such as lab/field techniques, communication, and teamwork (Seymour et al. 2004; Lopatto 2004a, 2004b; Bauer and Bennett 2003; Kardash 2000).

Information Literacy and Undergraduate Research

The skills targeted and enhanced during undergraduate research experiences, including reviewing literature; developing a hypothesis; designing and implementing an experiment; gathering, interpreting, and organizing data; and articulating and reporting findings and implications, parallel information literacy competencies and performance indicators. Faculty ranked the most essential features of undergraduate research projects as reading scientific literature, designing a project, developing meaningful research questions, and communicating findings orally and in writing (Lopatto 2003). A few articles and programs provided practical examples for integrating information literacy competencies in undergraduate research experiences:

- Students performed empirical or primary source research during which they gathered, organized, and interpreted sources and data (Tompkins 2007; Shapiro and McAdams 2006; Lopatto 2004b).
- Designing a research project (Meers, Demers, and Savarese 2004; Lopatto 2004b)
- Learning the field's ethical standards and science/research philosophy (Meers, Demers, and Savarese 2004; Lopatto 2004b)
- Communicating research findings, orally and in writing (Lopatto 2004b)

Writing-Intensive Courses

Writing-intensive courses may be the high-impact practice for which information literacy is most often an explored, articulated component. Librarians commonly offer research and information literacy instruction with writing/composition instructors to prepare students for college-level writing. Since information literacy is a frequently explored and articulated component in composition courses and the relationship has been heavily documented in the library/information science literature, the review that follows assumes the documented relationship and focuses instead on challenges, opportunities, and possibilities for fruitful integration.

The fields of information literacy and composition share similarities in mission and vision, pedagogical and curricular history, and the processes of writing and researching

(Elmborg 2003; Jacobs and Jacobs 2009; Norgaard 2004). To write an essay or research paper requires IL competencies such as the ability to search for and evaluate information and to use sources to effectively present an argument. Students frequently experience anxiety or apprehension when faced with a writing or research task, a phenomenon explored in both fields and referred to as “writing apprehension” or “library/ research anxiety” (Birmingham et al. 2008). The writing and research processes are “messy” and nonlinear, necessitating widespread curricular integration and reiteration throughout the academic career (Galvin 2006). The assumption that information literacy and written communication are generic skills causes similar challenges for both fields. The skill-based paradigm is reiterated by traditional foci on the formalities and mechanics of writing and research, which reduces these rich, contextual fields to the mastery of mechanical tasks and isolated skills (Lupton 2008). Writing-intensive courses that require a traditional research paper may attempt to incorporate information literacy but can cause fear of librarians and the research and writing processes (Norgaard 2004).

Writing Across the Curriculum (WAC) programs provide a model for establishing writing courses and information literacy initiatives that reiterate writing and research competencies beyond a stand-alone composition course. WACs develop writing skills at all levels of the academic experience, not only in courses for which writing is the primary focus. WAC is an integrated learning strategy that supports an assumption that students will become better writers if they write in every course (Galvin 2006).

Discussion

This article explored whether selected high-impact practices included the expectation that students either have information literacy as a prerequisite or should have acquired competency in information literacy during the experience. This examination revealed that information literacy competencies are included in these high-impact practices, although they are not usually called “information literacy” in the literature. The Appendix is a table that includes each high-impact practice examined for this article along with the information literacy competency to which it referred.

The literature confirmed that these practices provide excellent opportunities for embedding information literacy. This is because the practices often include active, contextual pedagogies, span the college experience, and engage students in the learning process. It is noteworthy that while the studies indicated that information literacy is an outcome in these high-impact practices, they did not report that it was a prerequisite. Curriculum mapping would help in understanding the expectations that instructors hold for students before they enter courses or specialized programs (Uchiyama and Radin 2009).

Although faculty believe that it is important that undergraduates understand the research process for capstone projects (Bender 2003), “undergraduates may not fully understand the scientific process, let alone the peer-review process for scientific literature . . . Students generally lack effective online search skills. Also, undergraduates in life sciences frequently exhibit rudimentary critical thinking skills” (Berzonsky and Richardson 2008, 8). This can be addressed with instructional teams that include librarians who work together to plan strategies for meeting the course objectives.

Service learning offers possibilities for development of information literacy proficiencies. These experiences develop an understanding of information literacy as necessary for survival in the digital information age (Watts 2006). In addition to skills that relate to critical thinking (problem-solving, planning and completing a project, and knowing where to find information), the information literacy competency standard that may best apply to most service learning experiences is understanding the economic, legal, and social issues that impact the use of information (ACRL 2000). Performance indicators for this standard include the ability to identify and discuss issues related to privacy and security, free versus fee-based access to information, censorship and freedom of speech, and intellectual property and copyright issues. As students assist and work with organizations and individuals in the community, these broad, yet important issues may emerge.

Recommendations for Practice and Research

The literature examined for this article reveals that there are many possibilities for advancing practice and future research.

Assessment

Assessment of students' information literacy competencies is necessary to better understand their role in the success of high-impact practices. For example, are students who have greater competence in information literacy more likely to participate in high-impact educational practices? Does participation in a high-impact practice motivate students to strengthen their information literacy competencies? Do instructors who lead high-impact practices have the expectation that students will have information literacy competency as a prerequisite to participating in the practice? Do students who participate in high-impact practices have more success in the workplace and in lifelong learning? The development and implementation of additional tools to assess information literacy would better capture the information literacy needs of today's students at programmatic, institutional, and national levels. These data would inform the planning of administrators, librarians, and faculty, including those involved in the development and implementation of high-impact practices.

One example of an assessment approach, explored by Mark and Boruff-Jones (2003) and Gratch-Lindauer (2008) involves engagement surveys such as the National Survey of Student Engagement (NSSE: <http://www.nsse.iub.edu/>), the Community College Survey of Student Engagement (CCSSE: <http://www.ccsse.org/>), or the College Student Experiences Questionnaire (CSEQ: <http://cseq.iub.edu/>) to assess the integration of information literacy at the institutional level. The NSSE reports, for example, address the use of technology, critical thinking, and ethical awareness, all aspects of information literacy. These surveys can also provide a point of collaboration for libraries, administrators, and student services leadership and staff to work together to assess the role of information literacy in student engagement and as a contribution to overall success.

Pedagogy

Instructors, instructional and program planners, and curriculum designers may include critical reflection exercises related to information literacy into the educational experience, as Riddle (2003) advocated for service learning. Guided reflection exercises encourage students to focus on particular elements of a learning experience. Possible topics for reflection might be the process by which the students found information for projects or assignments, the comprehensiveness or quality of the information they found, and questions that remain in their minds after compiling and synthesizing information.

Writing and research should be taught as *processes*, not end products (Birmingham et al. 2008; Elmborg 2003; Galvin 2006; Jacobs and Jacobs 2009; Lupton 2008; Norgaard 2004). Writing courses should focus on how the complex information world affects the research and writing process. For libraries, rhetoric and composition provide a relevant, historical intellectual tradition and a process-oriented vehicle for teaching information literacy. For rhetoric and composition, information literacy can provide a broader context for writing programs, extending beyond the classroom and into broader “social, civic, and intellectual relevance” (Norgaard 2004, 226). Instructors should look beyond traditional academic exercises such as the research paper and develop inquiry-based projects that are more practical and effective tools for learning.

Program Planning

Many of the publications cited are studies of one high-impact practice in one institution. There is a need to learn whether integrating information literacy competencies in these practices is common across institutions. Further research would help in understanding what methods are most effective in working with these specialized groups.

Student involvement in high-impact practices varies by discipline. For example, students in nursing participate more than students in other majors in service learning, whereas students in elementary and middle school teacher education and journalism participate more than students in other majors in internships or practica. Students majoring in history and political science participate more than students in other majors in capstone experiences, and students majoring in chemistry and physics participate more than students in other majors in research with faculty (National Survey of Student Engagement 2010). Librarians who are liaisons to these areas can focus on developing programs for the high-impact practices that are more commonly used in their subjects.

Information literacy programs should include partnerships and collaborations by working with leaders of high-impact practices on their campuses. Hunt and Birks (2004) examined select best practices for information literacy programs. Although the best practices are geared toward campus-wide programs, they could apply to high-impact practices as well. These include the establishment of goals and objectives to align with those of individual programs, departments, and the institution; administrative and institutional support to incorporate information literacy as essential to the institution; articulation with the curriculum; collaboration among librarians and departmental faculty; constructivist, active pedagogy; and assessment of process and product (Hunt and Birks 2004).

To successfully incorporate and assess the integration of information literacy competencies into learning, the competencies should be embedded in the program planning or instructional design process. Instructional teams that plan and teach for high-impact practices should include librarians, as well as faculty, advisers, and technology professionals (Brownell and Swaner 2010). Relevant competencies should be articulated as measurable learning outcomes; appropriate, engaging pedagogy should be developed and implemented; and assessment should reiterate learning, determine its extent, and inform revisions. Instructional and program planners should try to prevent a disconnect between information literacy and the content of the course or program. They should avoid focusing on a decontextualized generic information literacy skill set. They should consider not only what students will learn as a result of the experience but why it matters and how it will contribute to their overall success and development (Snaveley 2008). High-impact practices may offer a unique opportunity, since some practices (common reading programs and first-year experiences, for example) are geared toward the first-year college student; some (writing-intensive courses and service learning, for example) may occur in the middle or throughout the college experience; and others (especially capstone experiences and internships) culminate the college experience. Advocacy and collaboration are necessary for a holistic, integrated approach. A topic for further investigation is the development of effective, scalable models for the involvement of librarians in these important programs.

Librarians and information literacy specialists should be thoroughly integrated into learning community instructional teams from course planning to assessment (Frazier 2006; Laufgraben and Shapiro 2004; Pedersen 2003). The literature reveals that integration and collaboration are occurring but not consistently in institutions. Librarians should partner with those who work with learning communities at a deeper disciplinary level and with communities focused on themes beyond adjusting to life in college. It is within these challenging, intellectual communities where knowledge creation most often occurs and where critical thinking and information literacy can be most effectively and richly integrated. Student affairs professionals, librarians, and departmental faculty can design and implement learning communities that foster information literacy skills and develop effective assessment methods to measure their impact on developing higher-order thinking skills.

An area for future research is to identify the skill sets, knowledge, and attributes that contribute to success in these roles for librarians. Then relevant professional development programs can be developed so that librarians can enter into partnerships with confidence and competence.

Conclusion

As the examples highlighted in this article demonstrate, there is much opportunity for pedagogical conversation and cross-pollination among and between librarians, student services administrators and staff, and leaders and practitioners of high-impact practices. This interdisciplinary exploration revealed that collaborations among constituents of the various practices are at an early stage. These groups have similar goals and face similar challenges. Working together, they could do much to support the development of information-literate students in an effective, engaging way. Though disciplines may refer to

“information literacy” by different names, such as “information and communication technology (ICT) literacy,” “digital literacy,” “critical thinking,” or “oral and written communication skills,” they are working toward the same learning goals. Truly integrated, deep learning experiences could be more easily and effectively achieved and assessed if groups across campuses more often collaborated to develop strategies to instill information literacy.

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Appendix. First Authors of Reports of Information Literacy in High-Impact Practices
(from list of references)

	Capstone experiences	Learning communities	Service learning	Undergraduate research	Writing- intensive courses
Determine the extent of information needed.	Bolinger Brooks Epstein Ford Matos McGoldrick Ostheimer	Frank Hensley Laufgraben Lebbin Young	Quitadamo Vogelgesang	Lopatto 2003 Lopatto 2004	Birmingham
Access the needed information effectively and efficiently.	Berzonsky Brooks Epstein Ford Mayfield McGoldric Narasimhan Oh Roscoe Sasser	Frank Frazier Hensley Laufgraben Lebbin Young	Spiezio	Tompkins Meers	Birmingham Lupton Jacobs
Evaluate information and its sources critically.		Frank Frazier Hensley Laufgraben Lebbin Young	Spiezio Quitadamo	Meers	Birmingham Lupton Jacobs
Incorporate selected information into one's knowledge base.	Brooks McGoldrick	Frank Hensley Laufgraben Lebbin Young	Quitadamo Spiezio	Tompkins	Lupton Jacobs
Use information effectively to accomplish a specific purpose.	Berzonsky Bolinger Brooks Epstein Ford Matos Mayfield McGoldrick Oh Ostheimer Robbins Roscoe Rosenberry Sasser	Frank Hensley Laufgraben Lebbin Walker Young	Quitadamo Vogelgesang	Lopatto 2003 Lopatto 2004 Snively	Birmingham Elmborg Galvin Lupton Norgaard

	Capstone experiences	Learning communities	Service learning	Undergraduate research	Writing- intensive courses
Understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally.		Frank Hensley Laufgraben Lebbin Young	Spiezio	Lopatto 2004 Meers Lopatto 2004	Norgaard Lupton
Critical thinking	Berzonsky Brooks Epstein NSSE Robbins Rosenberry	Brownell Frank Frazier Hensley Laufgraben Lebbin Stefanou Walker Young	Brownell Quitadamo Spezio Sedlak	Brownell Meers	Lupton Elmborg Jacobs